

Listing of the Claims

1-41. (Canceled)

42. (Currently Amended) A process for removing water from a first solution, said process comprising:

i) providing a first solution comprising seawater or brackish water,

ii) forming a second solution having a higher osmotic potential than the first solution by dissolving a selected solute in water, wherein the second solution formed is substantially free of components that cause membrane fouling,

iii) directly adding into the second solution ~~including~~ an additive selected from the group consisting of anti-scaling agents, anti-fouling agents, corrosion inhibitors and disinfectants ~~in the second solution~~,

a) positioning a first selective membrane between the first solution and the second solution, such that water from the first solution passes across the first membrane to dilute the second solution by direct osmosis, and

b) passing the diluted second solution through a nano-filtration membrane, wherein the second solution contains solute species too large to pass through the pores of the first selective membrane and the nanofiltration membrane.

43. (Previously Presented) The process as claimed in claim 42, wherein the additive is at least one of an anti-scaling agent and an anti-fouling agent.

44. (Previously Presented) The process as claimed in claim 43, wherein the additive additionally includes at least one of corrosion inhibitors and disinfectants.

45. (Previously Presented) The process as claimed in claim 42, wherein the nanofiltration membrane is suitable for the separation of components that are 0.001 to 0.01 microns in size.

46. (Previously Presented) The process as claimed in claim 42, including the steps of dividing the diluted second solution from step (a) into a first portion and a second portion, extracting solvent from the first portion by passing the first portion through the nanofiltration membrane of step (b), and extracting solvent from the second portion by at least one of crystallization and distillation.

47. (Previously Presented) The process as claimed in claim 46, comprising treating the residue from the nanofiltration step (b) by at least one of a crystallization and distillation technique.

48. (Previously Presented) The process as claimed in claim 47, wherein the crystallization and distillation technique is selected from multi-flash distillation, multi-effect distillation, mechanical vapour compression, MED-thermo compression and rapid spray distillation.

49. (Previously Presented) The process as claimed in claim 42, wherein the second solution is an aqueous solution and said solute species is selected from the group consisting of $\text{MgSO}_4 \cdot 6\text{H}_2\text{O}$, $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$, $\text{MgCl}_2 \cdot 6\text{H}_2\text{O}$, $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$, $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$, $\text{CaCl}_2 \cdot 6\text{H}_2\text{O}$, potassium alum $\cdot 24\text{H}_2\text{O}$, potassium chloride, $\text{Na}_2\text{HPO}_4 \cdot 12\text{H}_2\text{O}$.

50. (Previously Presented) The process as claimed in claim 42, wherein an elevated pressure induced in the second solution by influx of water from the first solution is used to assist in the extraction of water from the second solution.

51. (Previously Presented) The process as claimed in claim 42, wherein after water from the first solution passes across the membrane to dilute the second solution, the diluted second solution is contacted with one side of a further selective membrane and a further solution having a higher osmotic potential than the diluted second solution is contacted with the other side of the membrane, such that water from the diluted second solution passes across the membrane to dilute the further solution.

52. (Previously Presented) The process as claimed in claim 42, comprising circulating the second solution in a closed loop, such that said additives are reused.

53. (Previously Presented) The process as claimed in claim 42, wherein the selective membrane of step a) has an average pore size of 5 to 50 Angstroms.

54. (Previously Presented) The process as claimed in claim 42, wherein the selective membrane has an average pore size of at least 10 Angstroms and the second solution contains solute species that are too large to pass through pores of the membrane.

55. (Previously Presented) The process as claimed in claim 54, wherein the solute species in the second solution comprises at least one of an cationic species and an anionic species that is larger than an average pore size of the nanofiltration membrane.

56. (Previously Presented) The process as claimed in claim 42, wherein the water extracted from the second solution is used to pump oil from oil wells.

57. (Previously Presented) The process as claimed in claim 42, including heating the solution on either side of the first selective membrane to a temperature of up to 80°C.

58. (Previously Presented) The process as claimed in claim 42, comprising extracting water from the diluted second solution of step (b) by two or more sequential nanofiltration steps.

59. (New) A process for removing water from a first solution, said process comprising:

a) positioning a first selective membrane between (i) a first solution comprising seawater or brackish water and (ii) a second solution with a higher osmotic potential than the first solution, the second solution substantially free of components that cause membrane fouling;

passing water, by way of direct osmosis, through the first selective membrane, from the first solution to the second solution to form a diluted second solution;

adding, directly into the second solution, chemical additives selected from the group consisting of anti-scaling agents, corrosion inhibitors, anti-fouling agents, and disinfectants;

circulating the second solution in a continuous loop; and

passing the diluted second solution through a nanofiltration membrane wherein the diluted second solution contains solute species too large to pass through the pores of the first selective membrane and the nanofiltration membrane.

60. (New) The process of claim 59 comprising passing the water through the first selective membrane into the second solution at a rate of $2 \text{ l/m}^2/\text{hr}$ to $80 \text{ l/m}^2/\text{hr}$ in the absence of applied pressure on the first solution.

61. (New) A process for removing water from a first solution, said process comprising:

positioning a first selective membrane between (i) a first solution comprising seawater or brackish water and (ii) a second solution comprising magnesium sulfate, the second solution substantially free of components that cause membrane fouling and having a higher osmotic potential than the first solution;

passing water from the first solution across the first selective membrane and into the second solution by way of direct osmosis and forming a diluted second solution;

adding, directly to the second solution, an additive selected from the group consisting of anti-scaling agents, anti-fouling agents, corrosion inhibitors and disinfectants; and

passing the diluted second solution through a nanofiltration membrane wherein the diluted second solution contains solute species too large to pass through the pores of the first selective membrane and the nanofiltration membrane.